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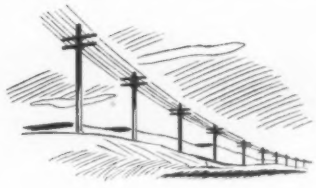
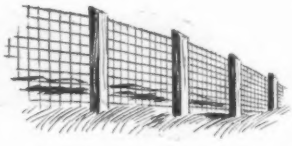
Some things to consider about Wood Preservation



Every year American railroads put in service some 45 million cross ties.

Every year American telephone and telegraph companies set out some 8 million poles.



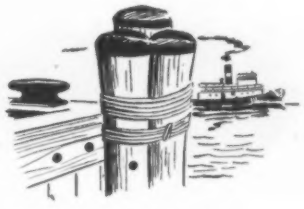
The choice of a wood preservative to protect these multi-million dollar investments is a serious matter—especially in these days of exceedingly high costs for lumber and labor.

That's why the following facts about Creosote Oil deserve your careful consideration:

1. Creosote Oil, properly applied, protects wood against dry rot, termites, fungi and all wood-destroying organisms—extends the life of wood three to five times, or longer.

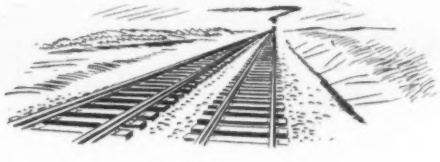
2. It is the most widely used, most universally preferred, wood preservative in the world.

3. Creosote Oil for the pressure-treatment of wood has been in use long enough to *prove* its effectiveness beyond all shadow of doubt.



When—and if—a truly better method of preserving wood is found, you may be sure that Barrett, with more than a half-century of wood-preserving experience, will be among the first to sponsor it.

Until then, the sound way to protect your lumber investment is the way that has worked for the last hundred years—by pressure-treatment with first-quality, time-tested Creosote Oil.



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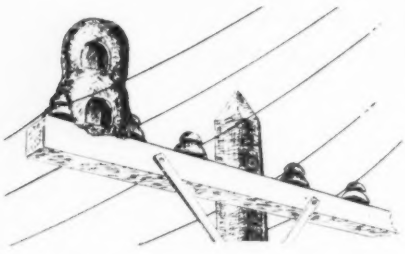
FLASHES AND PLUGS

THE HOUSE THAT JOHN BUILDS. It's the house that John builds which causes telephone linemen in Brazil to keep their spurs sharp and safety belts handy, according to *The Ohio Pioneer.*



Engineer's sketch of clay house in its original locale. A double dwelling, one story broke off in transit from Rio.

John is a modest but diligent member of the bird family, grey in color and about the size of a sparling, who solves his housing problem with the aid of his busy little wife. With uncanny skill, they combine wet clay with straw and build a dome-shaped home with a winding entrance doorway. The hot sun bakes the clay until the dwelling is as sturdy as the adobe huts built by the superior intelligence of humans. The more sociable of the Johns build their dwellings side by side, or one above the other, or even an apartment type with as many as four separate entrances. Each house is about the size of a man's head. A favorite locale for the home is the clean flat top of a cross-arm on a telephone pole.

The fact that this interferes with transmission over those long, funny, worm-like wires is of no consequence to Casa Joao de Barro, as Brazilians have named these birds. Literal translation of the name is John of the Clay House.

The line guards of the Brazilian Telephone Co., whose duties compare with that of our toll repairman, have orders to remove the clay homes as soon as they appear. The time it takes to build a bird adobe home, according to the line guard, varies with his audience—to the boss it's several hours—to a stranger, several days.

As to the actual construction work of the clay and straw home, some say the two birds each work in the same manner bringing the material in their bills or claws. Others claim the male bird rolls in the soft, wet mud and comes home plastered. Then the female pecks at him and transfers the clay to the new home.

• • •

WHEN YOU'RE AWAY. A cure for the $64 headache of the man whose telephone rings just as he climbs into the bathtub is a portable automatic machine which answers your telephone with your voice when you're not there. Before you head for the bathtub, you dictate "instructions" to anyone who may call you.

Then you can lather up, relax and wait for the telephone to ring, as it always does.

After the first ring, smart li'l Tele-Magnet lifts the receiver and starts a phonograph record of your message.

The gadget then becomes a silent secretary that takes down any message on a wire recording device.

The magic mouthpiece will record up to 60 minutes of messages.

• • •

THE VOICE WITH A HEART. A young New Yorker—so the story goes—was in the middle of a telephone plea to be taken back by the girl he loves when an operator had to cut in to request another five cents for another five minutes. "But I haven't got five cents and I love her," moaned the young man. There was a pause, and then, "I will allow you another five minutes."

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

Senate and House Bills regarding rural telephone financing discussed . . . Welch questions idea that all farmers desire telephone service . . .Status of Bell System rate cases in the states presented.

THE LEADERSHIP of the House of Representatives was expected to make a decision this week (Mar. 21) on calling up the Poage Bill (H. R. 2960) to authorize Rural Electrification Administration loans for farm telephone facilities. The bill earlier had been slated to go to the floor on Mar. 16, but the House got behind in its schedule and the measure had to wait for other matters to clear.

In any event, it was not expected that there would be much doubt about a favorable vote, when the bill comes up for action. Well worth attention, however, is the size and composition of the House vote on a special "anti-duplication" amendment, likely to be introduced from the floor during the House debate. This amendment, if proposed, would prevent REA loans from being made for financing competitively with existing farm telephone companies.

In view of Representative Poage's stout refusal to give up his idea of competition (as a desirable incentive to encourage rural telephone promotion) the chances of an "anti-duplication" amendment were not too promising on the House side. But the strength of a vote, on the question, should give an insight into the sentiment of the House members.

Over on the Senate side, the REA rural telephone loan bill has already started to move. Last week Senator Hill (D., Ala.) introduced a brand new bill (S. 1254) on behalf of himself and eight other Senators. It is, in most respects, an exact companion of the Poage Bill, now awaiting approval in the House. But it does not contain the so-called "Cotton amendment" to prevent telephone system operators, subject to state regulation, from getting REA loans without clearance from their state authorities. Nor does it contain the small company preference clause on applications mailed to REA six months after the law becomes effective.

Hill was joined on this new bill by Senators Johnson (D., S. C.), Langer (R., N. D.), Gillette (D., Iowa), Kerr (D., Okla.), Pepper (D., Fla.), Aiken (R., Vt.), and Young (R., N. D.). The new bill by Hill and the others may help to speed up Senate Agriculture Committee procedure laws, securing notice of broader support than if the bill was just dropped into the hopper by a single Senator.

Do Some Farmers Want to Pay For Service?

One of the serious questions posed by the Poage Bill is whether many American farmers are willing to take telephone service at any price which involves laying their own cash money on the line.

Witnesses before the House Agriculture Committee on behalf of the Independent telephone industry maintained that 85 per cent of the rural areas now have telephone company facilities within regular connecting distances of any farmer ready, willing, and able to pay for the same. This means, of course, that there are a good many farmers who, for one reason or another, just do not care to have telephone service, although the lines may pass right by their property.

You can still drive for miles along the highways of some of our agricultural areas and see telltale taped ends of former telephone connections on top of pole lines running right in front of farm houses. In some cases, these represent farm telephones discontinued during depression and never restored. What's more, these situations often involve farm properties the owners of which (by every reasonable standard) are well able to afford telephone service. They just do not want it and that is their privilege.

When one sees such an unconnected farm house—with a value of $5,000 or more, plus thousands of dollars worth of farm equipment, barns, and other buildings—it ought to be pretty clear that the farmer just doesn't feel like paying for telephone service. It is hard to see just how the enactment of a law authorizing REA financing would help this situation. Of course, if the Federal government proposes *to give* telephone service to the farmer without charge, doubtless a good many of those not receiving it now would be willing to take it. But the REA is supposed to be a lending and not a spending agency. The pending legislation in Congress is intended to finance new or approved construction in areas where such construction is necessary to bring service to the farmers.

A good example of how it is possible to go overboard on rural service—regardless of available financing—is shown by recent figures furnished to this writer from an Independent telephone company with 40 exchanges (mostly rural) in a middle-western state. The manager of this company states that between 1929 and 1948 his organization installed 18,055 company-owned rural telephones and took out 19,332, which represents a loss of company-owned rural telephones during that time of 1,277. Further, the company installed 4,787 switch (subscriber-owned lines) rural stations and took out 5,313, or a loss of 526 in switch rural stations during that period. The switch rates are quite low, so it seems that rates charged are not a factor. This company has a very low held order list, too, showing that very few farmers have applied for service.

The point to be made here is that this company spent considerable money during this period in constructing, maintaining, and rearranging facilities to serve farmers and this great loss is the result of the company's activities. The supporters of the new REA bills apparently do not know, or do not

want to say, how many farmers don't want service at any cost. Why can they not base their percentage of saturation on the basis of the number of farmers who really want telephone service and not on the total number of farms?

Here is another representative case of an Independent company serving an adjoining middle-western state in a village of 900 population, predominately rural. The manager of this company writes as follows:

"We serve 666 subscribers or rather have 666 telephones in service, 334 of these are urban or village subscribers and 332 are telephones serving the farmers, so you can see that half of our customers are farmers.

"In one of my territories . . . there are 258 farmers having telephone service and 87 that do not. Practically all of the 87 could be reached by placing the one drop pole and an installation fee of $1.50. Of these same 87 farmers, there are 46 that do not have electricity.

"In another of my territories . . . there are 71 farmers with telephones and 41 without, and 20 of the 41 do not have electricity either.

"We are serving in 13 different tax precincts, villages and towns, and have had practically the same territory covered with our lines since 1929 and have been taking care of our requests for service almost on an over-night basis. To my memory I do not recall of a single customer having to wait for more than two weeks to get telephone service. During the war he did not get the newest type of telephone but he got one that worked and was serviceable. At the present writing I have nine applications for either a re-grading of service or a change of instrument, or change from magneto to common battery service. We have extended our lines only in the direction where the farmers wanted our service. We have not extended our service to any area and forced a customer to take our service when another service was available, or wanted."

State	Total Increases Requested	Date of Last Order	Increases Granted or Made Effective	Pending Applications
Alabama	$ 2,530,000	3/17/48	$ 2,530,000 (*)	$
Arizona	2,329,000 (†)	3/ 7/47	865,000	1,464,000
Arkansas	1,750,000	9/24/48	1,750,000 (*) (‡)	
California	73,701,000 (‡)	2/23/49	41,364,300	20,655,000
Colorado	3,175,000		3,175,000 (†)	
Connecticut	4,765,000	10/17/47	4,163,000	
Delaware	975,000			975,000
District of Columbia	2,018,000	12/22/47	2,018,000	
Florida	7,243,000	12/23/48	4,014,000 (†) (‡)	3,229,000
Georgia	7,750,000	1/10/48	5,180,000 (*)	2,570,000
Idaho	1,247,000 (†)	1/10/47	645,000	602,000
Illinois	65,780,000 (†)	12/ 3/47	25,455,000	35,480,000
Indiana	4,490,000 (†)	10/20/47	3,065,000	1,000,000
Iowa	3,450,000	6/10/48	3,450,000	
Kansas	3,349,000	1/14/49	3,314,000 (*)	
Kentucky	4,068,000	11/ 9/48	3,630,000 (†) (‡)	
Louisiana	8,053,000 (†)	6/24/47	2,944,000	4,798,000
Maine	4,900,000 (†) (‡)	11/ 8/48	2,350,000	2,400,000
Maryland	10,397,000 (†) (‡)	3/11/49	9,377,000	
Massachusetts	14,860,000 (†)	7/24/47	4,860,000	10,000,000
Michigan	30,900,000 (†)	10/ 6/48	8,217,000	20,400,000
Minnesota	11,325,000 (†)	7/ 9/48	5,000,000	5,040,000
Mississippi	5,315,000 (*) (†)	2/ 7/48	2,390,000	2,400,000
Missouri	3,250,000	2/25/49	3,250,000	
Montana	545,000	3/22/48	317,917	
Nebraska	2,363,000	9/30/47	1,325,000	1,038,000
Nevada	None			
New Hampshire	3,469,000	7/30/48	2,325,000 (†)	1,000,000
New Jersey	32,150,000	11/25/47	10,515,000	16,000,000
New Mexico	248,000	12/17/47	248,000	
New York	49,000,000			49,000,000
North Carolina	5,139,000 (†)	1/30/48	1,630,000	3,430,000
North Dakota	989,000	12/20/48	989,000	
Ohio	11,335,000 (†)			11,335,000
Oklahoma	5,900,000	4/19/48	2,900,000	3,000,000
Oregon	6,366,000 (†)	1/ 8/48	1,554,408	4,116,000
Pennsylvania	25,000,000			25,000,000
Rhode Island	4,828,000 (†)	3/31/48	1,200,000	3,628,000
South Carolina	2,620,000	12/ 9/48	2,535,000 (†)	
South Dakota	1,637,000	12/27/46	531,000	1,106,000
Tennessee	4,057,000	11/ 6/47	4,057,000 (*)	
Texas	6,142,000		5,484,000	
Utah	1,776,000 (†)	8/10/48	591,203	864,000
Vermont	2,253,000	5/23/48	2,253,000 (†) (*)	
Virginia	4,140,000	3/26/48	4,140,000	
Washington	10,860,000	10/18/47	5,700,000	3,810,000
West Virginia	6,970,000	5/31/48	2,410,000 (†)	3,950,000
Wisconsin	17,800,000	9/18/47	6,400,000	8,300,000
Wyoming	287,000	1/12/48	287,000	
Total	$483,494,000		$200,398,828	$246,590,000

* Figure represents increases ordered by court on appeal from commission order.
† Figure represents total of more than one company request for rate increases, or action thereon.
‡ Figure includes temporary or interim increase pending further action.

Bell System Rate Cases

A very complete and enlightening round-up of Bell System telephone rate increases on a national scale was recently compiled by the National Association of Railroad & Utilities Commissioners (NARUC). According to this survey—released as a bulletin to its state commission members from the NARUC headquarters in Washington, D. C., by Austin L. Roberts, Jr., Assistant General Solicitor—more than $200,000,000 in rate raises have been granted to Bell System companies since September, 1946, when the first major postwar rate request was filed in North Carolina.

Specifically, the NARUC study covers the period from Sept. 17, 1946, to Mar. 15, 1949. Total increases granted, as of the latter date, amounted to $200,398,828, but pending applications total an additional $246,590,000. These granted rates, to date, represent roughly a raise in the average monthly telephone bill, (over the prewar as well as the period before September, 1946) of about one-sixth—as compared in an increase in the over-all cost of living of nearly three-fourths the prewar level.

System company rate increases have been applied for in all states except Nevada. In Delaware, Texas, and Iowa there is no commission regulation of telephone companies on the state level but certain "home rule" cities do have jurisdiction over rates. Excluding these three states, raises have been granted by state commissions to the full amount requested on applications where proceedings have been completed, in Arizona, Colorado, District of Columbia, Florida, Idaho, Massachusetts, Missouri, Nebraska, New Mexico, North Dakota, South Dakota, Virginia, and Wyoming. Regarding other applications on which state commission proceedings have been completed, (excluding the 13 just noted which granted 100 per cent of the amount sought) the percentages are as follows: California, 71 per cent; Connecticut, 87 per cent; Illinois, 84 per cent; Indiana, 88 per cent; Kentucky, 78 per cent; Louisiana, 90 per cent; Maine, 90 per cent; Maryland, 84 per cent; Michigan, 78 per cent; Minnesota, 80 per cent; Mississippi, 63 per cent; Montana, 58 per cent; New Jersey, 65 per cent; North Carolina, 95 per cent; Oregon, 69 per cent; South Carolina,

(Continued on page 38)

ALONG THE TOLL *line*

BY RALPH R. MABBS ILLINOIS BELL TELEPHONE CO.

NO. I—THE PARTS OF TOLL SERVICE

The use of toll operating practices is essential to the rendition of good long distance service. They have been tested and proved and are designed to help operators give the "best in service" to the public.

RECORDING signals aren't very polite. Not only do they frequently time their arrival poorly, but they have the consistent habit of ganging up at certain hours. And even in these "busy-hours" they are silently saying, "Plug me out, operator. For if you don't, quickly, your service is slipping."

The telephone user behind those signals, however, probably hasn't the slightest idea whether his signal pops up in a "busy-hour" flurry or not. He may not be aware that he's putting to work thousands of dollars worth of switchboards, toll lines and other intricate equipment. And he doesn't know how his operator records his call. But his telephoning experience has taught him to expect certain things to happen when he reaches for his telephone to buy a long distance call.

He has in mind a uniform bundle of items neatly wrapped in one service package. He looks for a quick response to his recording signal — a pleasant, business-like answer. He also expects helpful assistance in placing his call and completion to the right telephone in a short time. When he reaches his party, he wants to talk without interference. And, of course, he expects to be billed properly for the call.

He's a reasonable guy. He knows that all calls cannot be completed immediately. But when there is a delay, he wants to be kept well posted on how his call's doing—whether it's BY or NC—and he wants to feel he is being treated fairly.

In a two-paragraph nutshell that's the toll user's telephone wish. As we adjust our headsets and chairs and take an over-the-key shelf look at his service, we discover certain things an operator can do to help make it come true.

Be Prepared

The recording signal desires a short life. Suddenly, there it is, waiting, ready-or-not. Yet, the most it wishes to stand unanswered is 10 short seconds.

That isn't very long in any man's language. It probably takes longer than 10 seconds to light a cigarette or put on a new bonnet. But time plays some strange tricks with his second, particularly when a fellow's waiting. The toll user is no exception. Let him wait with his receiver off-the-hook more than 10 seconds, and he's wondering where his operator has disappeared.

FIRST OF A SERIES

This is the first in a series of articles on long distance operating . . . sort of a bi-monthly toll refresher. With an eye on the multiple and keyshelf and an ear to the customer's receiver, TELEPHONY is attempting to pull out some of the various operating threads for a closer look at the toll service fabric.

Traffic people, studying the causes of slow recording answers, have found that signals sometimes stand unanswered simply because the operator was unprepared to take the signal. Perhaps she mentally left her switchboard for a day-dreaming shopping tour—we all do a little day-dreaming once in a while. Or, maybe the operator didn't have the cord or key in a ready-to-answer position.

The telephone user also may find himself on the waiting end of a slow answer because his operator failed to take her signals on a first-come-first-served basis. He obviously is not getting the fair break when his operator does not follow the toll precedence rules and takes first the younger of two or more recording signals. And just for the record, the operator who answers her customer's signal, even in split-second time, and then closes the key before finding out what's on his mind isn't giving fast-answer service.

The Toll Ticket—An Operating Tool

Once the signal is answered, the ticket work begins. More than a simple sales slip, the toll ticket is an operating tool indispensable to good long distance service. To the uninitiated, it is a bewildering slip of paper which seems to require a combination lexicographer and cryptographer to convert its secrets into rational terms.

The toll operator, on the other hand, gets from it a clear-as-noonday picture of the calls in progress at her position. One glance and she knows whether her call is person, station or collect—her recorded ticket says so. It tells her where to, where from and how to get there. It's a good memory jogger, too. She is reminded when "T&C" is indicated, for instance, that her customer wants some rate information at the end of his call.

Authorized codes and abbreviations the operator uses are recording time-savers. This short-cut language of the telephone business is essential to speedy service and should be part of all operators' knowledge. Familiarity with the names of frequently called places comes in handy, too. It helps avoid unnecessary questioning of the customer; it saves recording time.

The information the operator records on her ticket, of course, must be as accurate and complete as possible. But, it must also be legible. Most everyone is handy at reading his own writing, even though it may look like the teeth in a comb or a camel's silhouette. No matter how complete and accurate, illegible tickets are of no use to others who must read and understand them—whether it's another operator working on a BY or NC or an accounting clerk preparing the bill.

"Going Out" on the Toll Line

Even before the operator has recorded and checked the calling party's

number, she starts his call on its way. Speedy completion is dependent on how soon she puts her switchboard multiple to work.

She must, of course, be familiar with her toll line multiple and position bulletin. And whether she uses her bulletin or goes to "Rate and Route," she should be sure to obtain all the routing information that's needed.

Well aware that she is sharing her circuits with others, the operator aims her every operation from here on out at saving valuable circuit time. Her use of toll lines affects her own immediate customer as well as other telephone users, perhaps many miles away, who wish to travel the same voice highways. Until the called office answers, she remains on the toll line as she "goes out," ringing and passing orders carefully and announcing the call distinctly.

On some calls, of course, she'll run into a busy circuit while holding her customer on the line. All of her attention is devoted to obtaining a toll line; she uses an alternate route immediately, if one is provided, and she's careful to keep her customer informed on the progress of his call.

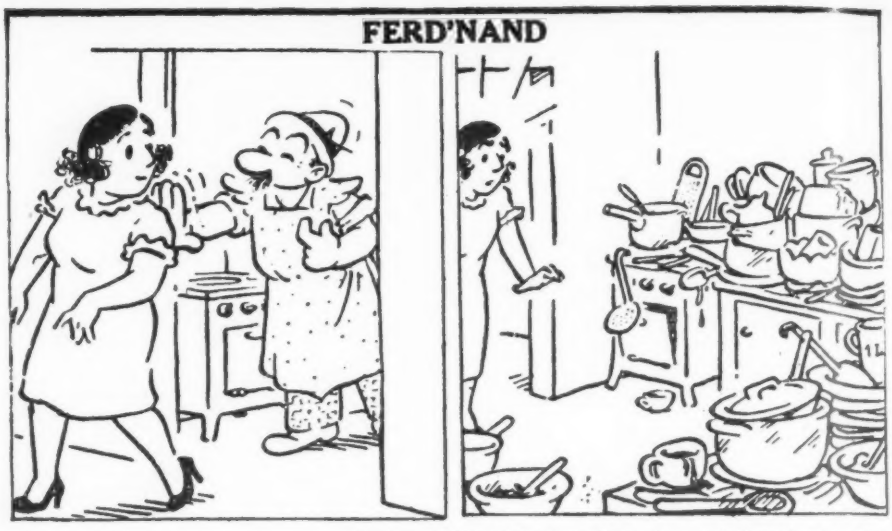
Oddly enough, the operator could be patiently waiting for a circuit which she herself failed to clear properly just a moment before. If she is slow to release circuits, doesn't clear on built-up calls, or gives a slow answer to supervisory signals, she is not only wasting circuit time of others but her own as well.

Switchboard Housekeeping

The overlap operation of releasing a toll line can be delayed simply because the operator is hiding her supervisory signals under her toll tickets or other operating tools.

Cartoonists poke continued fun at the man of the house who suddenly has the yen to read a cook book. With his hair in his eyes, this aproned male is shown up to his elbows in a major baking operation before a kitchen work table completely covered with mixing bowls, pots, pans, recipes, dishes and something that looks like a combination of flour, egg shells and vanilla. A cluttered key shelf can be as much a handicap to good toll service as a disarranged work table is to the outcome of that simple ginger bread.

Orderly switchboard housekeeping prevents delays and saves circuit time. By keeping cord clips, rate and route guides and other reference material, position notices, pencils and toll tickets away from the lamps and keys, the operator can see signals on her key shelf and speed the switches through her board. Of course, if she hides the lamps with her hands, signals stand unanswered, too.



(Courtesy, United Features Syndicate, Inc., and The Chicago Tribune)

Service Interruptions

No operator completes the connection between two telephones and then intentionally jumps in and heckles her customers with interruptions. That's just a matter of manners. But whether intentional or not, interrupted service is poor service.

Like playing pick-up-sticks, an operator must frequently remove a plug without disturbing an adjacent one. If a wrong cord is disconnected, someone's conversation is chopped off. The operator must be careful to associate cords with signals and be sure to trace the cord to be disconnected to the correct jack.

When there is a flash, she should answer before disconnecting the cord. Similarly, on a call from a magneto telephone, the operator should wait for a response after challenging just to make sure no further action is needed before taking down the connection.

How well a toll user can hear on his call is often controlled by his operator. If she knows, for example, that there is trouble or poor transmission on a circuit, she is running the risk of irritating her customer if she establishes a connection on it. (Transmission difficulties and out-of-order circuits should be reported promptly.)

Switchboard keys have a lot to do with transmission, too. Operating a listening key to the talking position on a busy line, for example, may let that customer in on what's happening in the operating room, but it doesn't help his ability to hear on the call. The telephone user may also have difficulty hearing if the plug is not carefully seated in the jack . . . or if his call was completed over an unauthorized route.

Tickets and Billing

Now that our customer has talked on his call, let's see to it that he's billed properly for it. The operator's part in getting the correct charge on the correct toll statement is in the accuracy and legibility of her ticket recording.

The calling number must, of course, be correctly recorded. As mentioned earlier, this and all entries on the ticket must be readable . . . a nine that looks like a seven is not a nine at all. The timing and rating of the call must be accurate, and if a time stamp is used, the operator should always make sure it is clearly and evenly printed.

Billing errors can result from an operator using incorrect codes or abbreviations on her ticket. It also is important that no pertinent information be left off a ticket. The name of a called state, for instance, is essential on many calls: There's a Hammond in Illinois as well as Indiana . . . the map shows several Springfields and more than one Newark.

* * *

Each of the many operations at a toll board is in some way related to another . . . each has a direct bearing on the quality of long distance service. A fast answer isn't worth much without completion. Speedy completion may not be remembered by the toll user served by a lackadaisical or impatient voice. And a pleasant toll call can become unpleasant if the caller's been over-charged for it.

The long distance operator who knows what's in the package called "good toll service" is not only in a position to judge her own work, but is also ready to give her customer the best service possible from her switchboard.

Not every condition an operator

(Continued on page 37)

THE PLANT MAN'S *note book*

BY
RAY BLAIN
TECHNICAL
EDITOR

RECENTLY we received a letter from Ray H. Perry, instructor in the San Antonio (Tex.) Vocational & Technical School, in which he refers to an item appearing on this page on Feb. 12, concerning the use of a water level gauge over a telephone line. Mr. Perry states as follows:

"Several years ago we worked out a plan for a small irrigation district several miles south of this city which had the same problem. We used a field rheostat to vary the 48-volt current, transmitted over a leased cable pair to operate a high resistance voltmeter. The voltmeter scale was modified to read in feet instead of volts. In this case, we did not operate a telephone on the same cable pair, however, this would not be difficult."

• • •

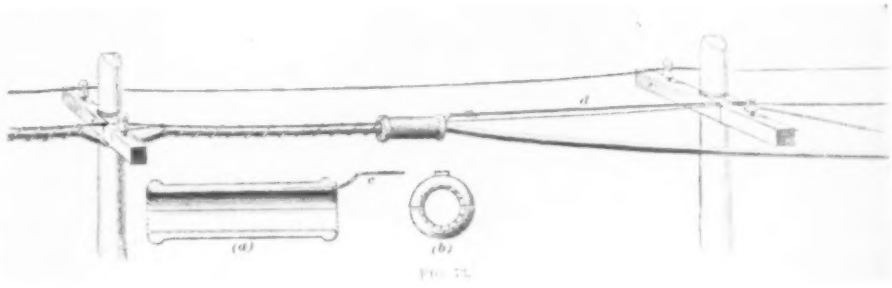
It has been said: "It takes less time to do a thing right than it does to explain why you did it wrong."

• • •

The accompanying photographic reproduction of a drawing of an early model cable spinner was made by Foy Blain, brother of the writer. This drawing and description was taken from an old book entitled: "A treatise on Telephony," prepared for students of the International Correspondence Schools of Scranton, Pa. It was copyrighted in 1899. The description states in part:

"Aerial telephone cables are frequently supported by wrapping the cable and supporting wire with strong marlin rope or twine as shown. The cable is drawn up to the supporting wire and wrapped to it with the marlin by means of the Chinnock cable winder commonly called the 'spinning-jenny.' The device as shown consists of a bobbin, made in two halves, with a hole through the center large enough to allow the cable and supporting wire to pass through it; (a) is a sectional and (b) the end view of the winder. The inside of the bobbin is nicely lined with cover to make smooth and wear well.

"To use the device, place the two halves over the cable and supporting wire, fasten them together by the hooks or other means provided and wrap on enough marlin to support the cable between two poles. Fasten one end of the marlin at one pole as shown and by pulling the bobbin along by means of a rope (d), attached to the projecting hook (c), the marlin twists itself spirally around the cable and supporting wire, draws the cable up close to the wire and the bobbin pushes before it the slack of the cable. When it reaches a support, the bobbin must be removed and replaced on the other side of the support and again wound with marlin. Sometimes two wrappings of marlin are used in order to make the cable more secure, requiring the process above described to be repeated between supports."



From this it may be seen that the idea of cable spinning is indeed old. It must be remembered, however, that this ancient arrangement was slow and cumbersome and cannot in any manner be compared to the modern and efficient machine now available which spins wire instead of marlin.

The use of marlin as described must have indeed proved a rather difficult task. In addition, the finished job was probably not overly neat or satisfactory.

• • •

It has been said: "A man may fall several times, but he isn't a failure until he starts saying somebody pushed him."

• • •

It is noted that numerous new light installation telephone and trouble trucks with the ladder racks mounted on top instead of the side are making their appearance in a number of large eastern cities. These racks are arranged in some cases to carry not only extension and step ladders, but also pike poles, tree trimmers and various other tools that may be required.

This type of ladder rack mounting appears to be much neater and safer to use than the old side mounted variety.

• • •

We are in receipt of a letter from Archie L. Wiselogel, Jr., president of the Parma (Mich.) Telephone Co., wherein he explains how he has connected condensers across the cord circuits of his magneto switchboards to provide an inductive ring back.

Mr. Wiselogel states that this inexpensive arrangement provides a clear signal to indicate to the calling party that the called party is being rung properly by the operator. We agree that this is always a valuable feature on any manual switchboard. Certainly the addition of special features of this type prove invaluable in the promotion of good public relations for any operating telephone company.

• • •

The writer had the pleasure recently of inspecting a drop wire clamp of a radically new design. This clamp is of the snubbing type and grips the wire firmly, but does not cause any damage to the insulation.

It is claimed that when this clamp is placed into production, its numerous advantages will be made possible without increased cost over the conventional type.

We always have maintained that manufacturers in the communications field deserve considerable credit for making their products as nearly perfect as possible. These manufacturers also have been most helpful in the furnishing of detailed information as to the proper methods of using their products in order to obtain the best results. It is, therefore, surprising that occasionally some user will ignore these instructions completely and then complain that the product is inferior. These people never seem to think, or even consider, that perhaps their careless methods might be at fault.

In this connection, there recently came to our attention a complaint that compression type splicing machines caused noise in a line after they had been in service for a comparatively short period of time. Inasmuch as this type of sleeve has consistently given such good service without even minor complaint, a thorough investigation was made to determine the cause of the noise trouble reported. The answer was soon ascertained and the trouble experienced was not the result of any fault of the sleeves, but of the man who used them. A compression tool was not available so the sleeves were installed by crimping them with an ordinary lineman's pliers. Why anyone would attempt to install sleeves without this most necessary tool is just one of life's little unsolved mysteries. One thing we can't understand, however, is how anyone, after doing such a sloppy job, could have the nerve to complain that the sleeves were inferior!

PLANT MAN'S QUIZ

Q. Will you please advise how a grounded rural line should be connected to the cable pair and where the ground on the central office end should be placed? There are about five different possibilities, but we prefer to follow the best approved practice.

A. While it is true that at least five different methods are possible and are all used to connect rural lines to the exchange cable, it is, however, our firm conviction that grounded rural lines should in all cases be connected through metallic cables. This arrangement tends to balance the cable pair and minimize the noise caused by inductive disturbances. In this case, the ground would be connected to one side of the cable pair at the cable terminal and not in the central office. The line should connect to the cable through an approved type protector equipped with a fuse and an open space cut-out. Adequate protection at this point is most essential if cable trouble is to be avoided.

In this connection, also, it must be pointed out that the grounded rural line should be considered obsolete in most localities and must be metallicized in the near future if a good grade of telephone service is to be maintained. This is particularly true in localities where power line parallels are in service.

• • •

Q. What precautions, if any, should be observed in the storing of poles in a yard?

A. The storage and care of poles in a yard should, in every case, receive careful consideration. Storage should also consider handling, sorting and stacking. The pole yard should, if possible, be located on high, well drained land, free from fire hazards and near rail and truck transportation.

It is most important that the pole yard be well maintained by keeping weeds cut. Remove, also, all decayed wood and rubbish from beneath and from around poles.

The poles should be stacked on treated timbers or skids supported at least 12 ins. above the ground in order to provide adequate ventilation. These skids should be spaced 15 ft. apart, or less, depending upon the length of poles being stored.

It is always a good practice to separate poles into various piles for length and class. When poles are stacked over two high, reverse the butts on alternate layers.

• • •

Q. We have an old line that is causing us considerable trouble because of pole failures. These poles should all be replaced. This is not, however, possible at this time and we plan on the replacement of only alternate poles. Is there any serious objection to this practice?

A. If the poles are such that they cannot be reset and stubbing is not considered desirable, then perhaps the plan you suggest will prove satisfactory in your particular case. In general, however, we would consider it a more expedient procedure to test each pole by rocking with a pike and only replacing poles that are actually broken. As a rule, key poles, such as road crossings or corners should be replaced first.

In our estimation, it would be far better for you to replace poles which are actually broken instead of every other one regardless of whether it has actually failed. New poles should be selected with a view to their carrying the ultimate load planned for that particular line.

• • •

Q. We are planning the construction of some new rural lines and would appreciate your advice as to whether buried wire will prove more economical than pole lines and aerial wire construction. We can purchase buried type wire for $12 a thousand feet and, considering the lower cost of maintenance, it would appear that this type of plant will prove more economical in the end than aerial lines.

A. From an outside plant standpoint, the economy and desirability of the use of buried wire will vary materially with local conditions. When soil and other conditions are satisfactory for underground construction, and trees or other conditions are unfavorable to the use of open wire, then buried wire may prove the better arrangement of the two types of plant. The cost of buried wire plant is considerably reduced when the soil conditions are such that a wire plow may be used for its installation.

If wire is buried, a suitable location must be selected along highways in order that it will not be disturbed by future road grading operations. Extreme care must also be exercised in order to protect the wire where it crosses streams and gullies. If the wire is attached to a bridge, it is generally best to protect it in conduit.

A ground wire must be provided to protect buried wire from lightning and induced voltages. This bare wire must be laid in the trench along with the wire pair or pairs over its entire length. A recent development consists of a buried type wire which is protected with steel tape armor. This type of wire, though more expensive, provides much better mechanical protection and does not require a ground wire to be buried with it. If this mechanical protection is not provided, damage may be experienced in some sections of the country from rodents and ants.

As a rule, buried plant consisting of unarmored wire has not proved entirely satisfactory. It is, therefore, suggested that all local conditions be carefully considered before making a definite decision to use buried wire in preference to aerial plant.

SIGNAL CORPS DEVELOPS *Miniature Radio Set*

A MINIATURE transceiver, weighing only 11 ounces and so small that it will fit into a king-sized cigarette package, was unveiled by the Signal Corps Engineering Laboratories at Fort Monmouth, N. J., on Mar. 3, the 86th anniversary of the founding of the Signal Corps.

This tiny set, believed to be the only radio of its size in the world that contains in one package all necessary component parts, including the power supply, will transmit and receive spoken messages over distances greater than 200 yards. Although the Signal Corps firmly maintains that the transceiver is just an experimental model, it is admitted that it is an excellent example of miniaturization techniques which are a primary goal of equipment development for military use.

GEORGE E. COLMAN, an engineer employed by the Signal Corps Engineering Laboratories at Fort Monmouth, N. J., and designer of the Signal Corps miniature radio set, is shown speaking into the transmitter.

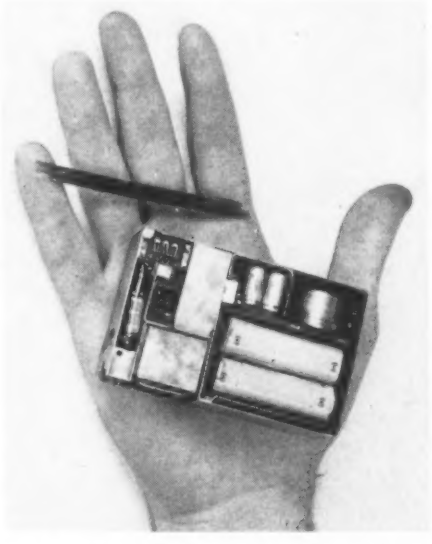
This remarkable little set was designed by George E. Colman, an engineer of the Signal Corps Engineering Laboratories. The set has two "B" batteries, one "A" battery, a two-foot collapsible whip antenna that folds into the case of the set. It also has four sub-miniature tubes, plus the usual internal radio components, all contained in a tiny metal case that is only one inch thick, two and a quarter inches across the base and three and a half inches high. The speaker and microphone are cleverly built-in. The lid of the set opens slightly to become the bell of the speaker and the opening through which the voice reaches the microphone.

Despite its extremely small size, the new set employs all the latest construction features, such as plug-in units which are merely pulled out and discarded in the event of failure of any of the component parts. Thus, repair of the set becomes almost as simple as replacing an open fuse in an ordinary home electrical system. Even the batteries, which have a life span of approximately 14 hours, are of the snap-in variety thereby requiring no wiring when replacement is necessary.

The "Handie-Talkie," a Signal Corps radio made famous during World War II, is the nearest thing that the Signal Corps has to the new set as far as size and weight are concerned.

The "Handie-Talkie," used by thousands of troops in the field and on the beachheads all over the world, weighs six pounds, is over a foot in length, four and a quarter inches deep and three and a half inches wide.

Even though the Signal Corps experimental set uses parts so tiny that jewelry tools were necessarily used in its construction, it still lends itself to tropicalization—the Signal Corps term for moisture and fungus proofing—found so necessary to proper operation of all electronic devices in the heat and humidity of the jungles. When sealed, it makes possible the landing of equipment by floating through the surf without impairing its operating efficiency.



This is how the Signal Corps experimental model of a miniature transceiver looks with cover off.

QUESTIONS AND TENTATIVE ANSWERS

PLANT *(Continued)*

(7) What assistance, if any, will be given to the customer who owns his equipment to see that it is maintained properly?

A. The customer should look to the manufacturer of the mobile radio equipment and to the concern making the installation to keep the equipment in good working order.

• • •

(8) Will radio log records have to be maintained at each mobile station using telephone company owned equipment?

A. No. The traffic ticket record of calls completed and cancelled can be used as a check on the operation of mobile stations.

• • •

(9) Will any record have to be maintained of the serial number of the radio transmitters in each mobile unit?

A. No; however, it is possible that future FCC requirements may require such records.

V V

It would be interesting, if for no other reason than as a challenge to the rate and route operators, to place a call to the Welsh village of Llanfairpwllgwngyllgogerychuryrndrobwllandisiliogogogoch — which is allegedly the longest name in the world.—

Indiana Telephone News.

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MAINTENANCE TESTING EQUIPMENT

By JOHN A. BRACKEN

RESISTORS used to limit the current flowing in a pre-payment telephone line test circuit to obtain the required voltage for a particular part of the circuit may be classified as fixed and variable.

PART XIX. The preceding article in this series appeared in the Mar. 19 issue, p. 15.

A fixed resistor inserted in the test circuit is one whose resistance cannot be changed by mechanical means, and, generally, is of the wire wound type. A variable resistor, is one in which the amount of resistance may be varied. It is called a rheostat, that is, a resistor whose value of resistance at its terminals can be readily varied without opening the circuit and thus regulate the current flowing in the circuit to the load to which it is connected.

A combination of fixed resistors and variable resistors to comprise a rheostat, so arranged to serve the purpose of setting up an operating condition of 60 volts drop at a paystation coin relay, and then a nonoperate 40-volt drop by inserting sufficient resistance in the line circuit, is shown in *Fig. 1*, as a means of regulating the voltage and current of a direct current supply.

A, B, and C, of *Fig. 1*, are fixed resistors of 1,000, 2,000 and 3,000 ohms, respectively, and wired to separate keys in such a manner as to be short circuited when not needed. D, E, and F are variable resistors of 50, 150 and 300 ohms in series with the fixed resistors. The binding posts 1, 2 and 3 are arranged to divide the fixed and variable resistors into two groups when required.

For paystation testing purposes, binding Posts 1 and 3 are used to insert both the fixed and variable resistors in series SIMULTANEOUSLY. It will be readily observed that the introduction of the rheostat increases the total resistance of the circuit, consequently, the total current in the circuit is decreased.

The resistance of the fixed and variable resistors used to regulate the value of the current when making current flow tests on pre-payment paystation lines is obtained from special resistance wire composed of an alloy of two or more metals such as nickel, zinc, iron, chromium, copper, manganese, etc., presumed to be within values of resistance which are accurate within plus or minus 1 to 5 per cent above or below their normal resistance rating.

Alloys in general have much more resistance than the metals of which they are composed. However, the resistance varies in accordance with the materials used and the method of manufacture. Some of these alloy resistance wires have a relative conductivity as low as 7 per cent as compared to 100 per cent for copper wire of the same length and size. These are figures which indicate the relation between one substance and another as to their capability to conduct an electric current. Copper is taken as the standard in measuring the conductivity of metals.

When an electric current flows through the resistance wire, the function of the wire is to absorb electrical energy, and this energy appears as heat, that is, a certain amount of the

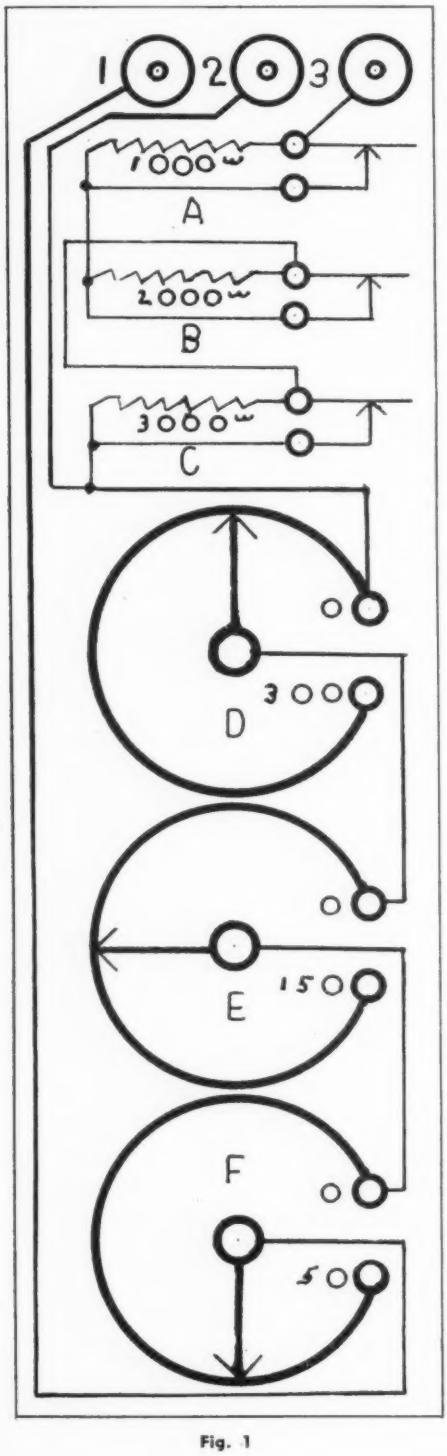


Fig. 1

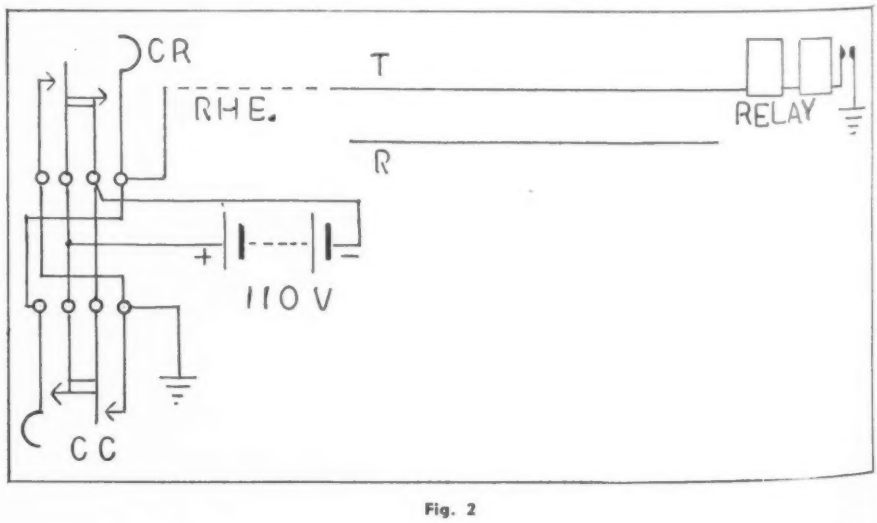


Fig. 2

electrical energy is changed into heat energy, and this heating effect becomes quite noticeable if the current is too large. The rise in temperature of the wire, from heating, causes a loss of energy because of the increase in the resistance of the wire and is an important factor in the construction of rheostats.

Furthermore, if the increase in temperature should exceed a certain limit, the rheostat insulating material used (if not heat resistant) is liable to be damaged. Therefore, the principal limitation in using current regulating rheostats is the heating of the unit. The heat developed in the unit is proportional to the product of the resistance in ohms and the square of the current in amperes. This product equals the number of watts of power being dissipated in the rheostat and, because of this, commercial rheostats which are used to regulate any appreciable amount of current are generally rated in the number of watts they will safely dissipate, as well as the number of ohms resistance.

Usually the watt rating given for some types of commercial rheostats is the maximum number of watts of power that it will dissipate without causing a temperature rise of about 400° Fahrenheit when the rheostat is surrounded with a free air space.

Another factor requiring attention relative to the rheostat, is that the cross-sectional area of the resistance wire must be sufficient to carry the current without excessive heating; also, the wire must not increase much in length when heated.

This increase in length of the wire when heated is called linear expansion, and the rate of expansion is known as the coefficient of expansion, and is defined as the increase in length per degree of temperature rise per unit length.

A low coefficient of linear expansion of a test circuit rheostat is desirable so that the windings will not expand and allow the different turns to come in contact with each other and perhaps become short-circuited, thus, lowering the rheostat resistance, and, thereby, increasing the current flowing through the windings.

As a matter of safety, and to insure long life maintenance testing equipment, rheostats should not be operated at a rate greater than about one-half the rating of the resistance wire in watts and at something less than about three-quarters of its maximum current carrying capacity.

In view of this, when selecting a rheostat, its current carrying capacity and power rating should be considered. The power rating may be found by the formula : $P = I^2 R$, where "P" equals power in watts, "I" amperes and "R" ohms.

Example: What will be the power rating of the three series connected rheostats D, E and F, shown in *Fig. 1* that will withstand a maximum current of 200 milliamperes or 0.2 amperes? $P = I^2 R$, or $0.2 \times 0.2 = .04 \times 500 = 20$ watts.

The current may be determined by the formula: $I = \sqrt{P \div R}$. Example: How much current can a 500-ohm 20-watt rheostat safely withstand? $I = \sqrt{P \div R}$, or $20 \div 500 = 0.04$; extracting the square root of .04 equals 0.2 and multiplying this by 1,000, two hundred milliamperes is obtained as the maximum current.

Certain kinds of rheostats used in test circuits are of the space winding type—that is, by spacing the turns of a layer of bare resistance wire wound on a tube of insulating material, and equipped with a manually adjustable sliding contact, supported by a metal bar running parallel to the axis of the tube. The contact travels along the length of the tube so that the current may be made to flow through any desired length of wire.

Another method is to wind on insulating material, circular in shape, and having a rotary level in contact with the wire as shown at D, E, and F, in *Fig. 1*. Both the tube and circular type of rheostat are very satisfactory arrangements for the purpose of reducing the amount of testing current flow to a prepayment coin machine relay.

Fig. 2 shows a battery and two keys designated "CC" (coin collect) and "CR" (coin return) so wired that when the "CC" key is operated, the battery minus pole will be grounded and the battery plus pole connected to the line through the rheostat.

When the "CR" key is operated, the reverse condition will be obtained, consequently, depending upon which key is operated, plus or minus battery current will flow through the rheostat, line wire and coin relay to ground, causing the relay armature to move to its collect or return position as the case may be.

(To be continued)

V V

Houghtaling Made Supervisory Engineer at Anchorage, Alaska

Jay Houghtaling, former district sales manager in St. Paul, Minn., for the Kellogg Switchboard & Supply Co., Chicago, was recently appointed supervising engineer for the rapidly expanding city-owned Anchorage, Alaska, telephone division, according to an announcement made Feb. 24 by Donald R. Wilson, city manager of Anchorage. Mr. Wilson indicated his choice following a visit to the Kellogg plant when he conferred with James H. Kellogg, president, and F. M. Parsons, sales manager of the Kellogg company.

JAY HOUGHTALING

A Kellogg employe for 31 years, Mr. Houghtaling retired from active duty with the company a year ago. He joined the company in 1917 and has been a member of the sales division since that time. In 1924 he was made a Kellogg representative in Minnesota and surrounding states. Since that time he has trained many Kellogg representatives from the north central territory. In all, he has had more than 50 years' experience in the telephone business and is considered one of the leading telephone consultants in the northwest, particularly in telephone engineering, construction and management.

Since his retirement, Mr. Houghtaling has served as a consultant for telephone companies in the northwest. Mr. Wilson said that the new appointee would serve for one year in supervising the setting up of Anchorage's new telephone exchange building and installation and cut-over of the city's soon to be installed, 3,000-line Kellogg dial switchboard and related equipment.

Mr. Houghtaling's background in the telephone field began while he was a high school youth at Fairmont, Minn., in 1897. At that time he worked as a night operator at the switchboard of the local Independent telephone exchange. After graduation from high school he became maintenance man, repairman and lineman for the Fairmont company. After studying electrical engineering at the University of Minnesota for two years, he left to become shop foreman for the Northwestern Bell Telephone Co. in Minneapolis.

Courts and Commissions

Ask 1947 Act Be Amended to Allow Collective Bargaining

Nebraska trade unions have requested the state legislature to amend the 1947 act, which created an industrial court to hear and determine labor-management disputes in governmental enterprises and public utilities, in order to permit collective bargaining.

The law as it now stands forbids strikes, or any other forms of interference with the functioning of utilities, and requires that in all industrial disputes the powers of the court be invoked. This includes fixing wage rates, hours and conditions of employment, and the outlining of other matters to be taken into consideration.

Opponents of the bill charge that to permit collective bargaining would completely wreck the statute.

V V

J. S. Holden, N. A. Lowe Appointed to Vermont PSC

Appointments of James S. Holden and Norman A. Lowe to the Vermont Public Service Commission were confirmed Mar. 18 by the state senate, thus paving the way for resumption of the $1,000,000 New England Telephone & Telegraph Co. rate case which had been postponed twice pending final approval of the commission appointees.

Mr. Holden was first named to the commission last fall, was reappointed, and, following senate confirmation, was designated as chairman by Governor Gibson.

Mr. Lowe succeeds Charles C. Morse.

V V

Make Improvements or Sell Exchanges, Commission Orders

The Central Carolina Telephone Co., Southern Pines, was ordered by the North Carolina Utilities Commission Mar. 18 to either make substantial improvements at its exchanges in Waxhaw and Matthews by July 1, or to sell them.

"Unless this is done, the commission will consider reducing the rates charged for services at these exchanges," the order said. That failing to bring results, the company may be required to move out of Waxhaw and Matthews, the commission pointed out.

Central Carolina, which operates exchanges at Angier, Ansonville, Bonlee, Carthage, Fuquay-Varina, Gibsonville, Kernersville, Marshville, Matthews, Norwood, Pinehurst, Pittsboro, Robbins, Siler City, Southern Pines, Summerfield, Vass and Waxhaw, has been under study by the commission for over a year.

On Jan. 28, 1948, the company was ordered by the commission to show cause why it should not be deprived of operating rights for failure to provide adequate service to its customers. Officials, summoned back by the commission on Sept. 19, said that the company would speed up ordered improvements and that in several cases they already had been carried out.

In its new order, the commission said that since September the company has installed new equipment and additional lines at most of its exchanges, new switchboards having been placed in operation at Silver City and Angier, and one now being installed at Fuquay-Varina. No work has been done, however, at Waxhaw or Matthews, the commission stated.

The commission announced that at Summerfield subscribers and the company have reached an agreement whereby the company will withdraw and permit another company to enter.

V V

Quincy, Fla., Independent Files for New Rate Schedule

An additional $14,244 a year in revenue was requested of the Florida Railroad & Public Utilities Commission by the Quincy (Fla.) Telephone Co. on Mar. 14.

Allen M. Drew, president, said the company's annual revenue of $39,759 is not enough to continue present services in Quincy and to expand plant facilities.

Raises were requested for all services except residence and rural extensions and eight-party business and rural residence telephones.

The commission took the request under consideration.

Requests Additional Increase To Cover Granted Wage Raises

The Carolina Telephone Co., Tarboro, whose request for a $700,000 rate raise already is before the North Carolina Public Utilities Commission, has requested the regulating agency to raise that figure to $911,978.

Company officials told the commission that they were applying for the additional $211,978 to cover wage increases recently granted employes.

Originally, the Carolina company had asked on Feb. 12 that its rates be upped by $230,000 to cover the pay raises. Officials reported, however, that further study of the company's needs had enabled them to scale the figure down to $211,978.

Hearing on the original request for $700,000 was held on Jan. 21. No decision on the matter has been announced yet, and the commission now is considering the two requests together (TELEPHONY, Jan. 8, p. 25).

V V

Inter-Mountain Co. Receives Higher Rates at Ten Exchanges

The Inter-Mountain Telephone Co., Bristol, Tenn., has been granted increased rates at 10 exchanges by the Tennessee Railroad & Public Utilities Commission. The new rates went into effect Mar. 1 for all exchanges except Johnson City, where they will be effective May 1 (TELEPHONY, Feb. 5, p. 28).

The increase will amount to 16 to 17 per cent of the company's revenue.

Delay in making the increase effective in Johnson City was pinned to a condition that service be improved. The condition was included in the commission's decision.

V V

SW Bell Asks Court Approval Of Second Temporary Increase

A petition was filed with the Oklahoma Supreme Court Mar. 18 by the Southwestern Bell Telephone Co., requesting judicial approval of the company's application to the state commission for a second temporary rate

(Continued on page 32)

He Helps to Get the Message Through

ILLUSTRATION BY NORMAN ROCKWELL

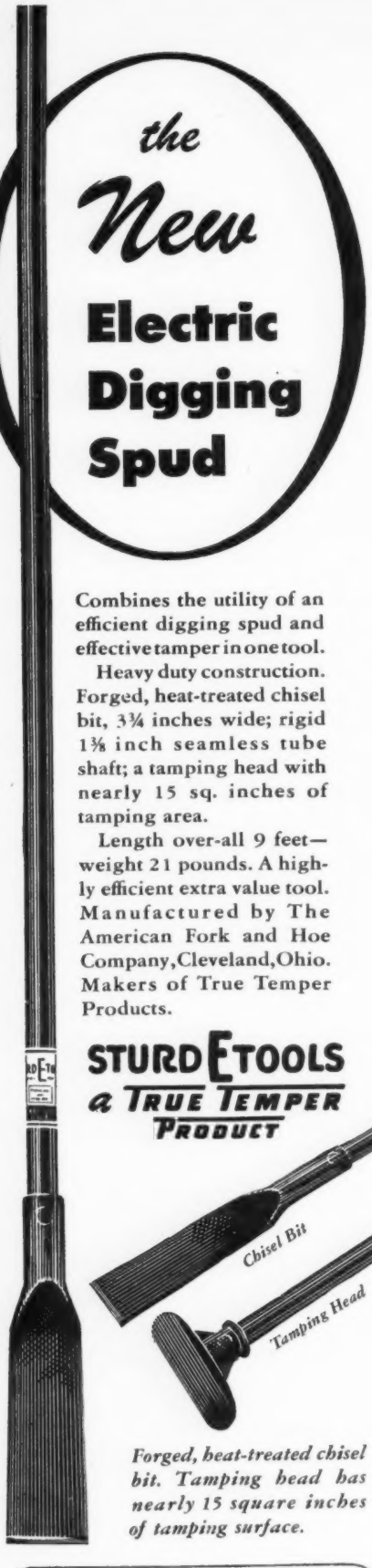
Along the highways of speech, in every part of the country, thousands of Bell telephone linemen help to keep your telephone service good — and make it better.

They are on the job to maintain uninterrupted service over millions of miles of wire and cable—repair trouble when it occurs and try to anticipate it before it occurs.

They are the men who push forward the lines of communication to new places and new people—through cities and towns, across deserts, under rivers and over mountain tops. By breaking all construction records since the war, they have played an important part in the constant improvement in telephone service.

In the everyday doing of the job, as in the dramatic emergencies of fire and storm, the telephone linemen help to get the message through.

BELL TELEPHONE SYSTEM



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Heavy duty construction. Forged, heat-treated chisel bit, 3¼ inches wide; rigid 1⅜ inch seamless tube shaft; a tamping head with nearly 15 sq. inches of tamping area.

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increase amounting to approximately $3,000,000. The first temporary raise was put into effect by the company on July 16, 1948 under a supreme court injunction restraining the regulatory agency from interfering with the increases. This injunction is still in force. Telephone subscribers are protected under a supersedeas bond, if lower rates should be ordered.

The latest application of SW Bell is in the form of an appeal from Commission Order No. 22,004, denying the company a second temporary statewide rate raise. Court hearing on the petition was set for Mar. 29 (TELEPHONY, Feb. 26, p. 32).

Hearings on the company's request for permanent statewide increases were resumed before the commission on Mar. 15 and 16. At that time, the commission heard testimony and received exhibits prepared by some of its own experts, in opposition to SW Bell presentations.

The commission's exhibits were designed to show that Southwestern Bell's depreciation, maintenance and replacement costs are too high and far above those of three of the largest Independent telephone companies in the state.

B. Richardson, commission telephone engineer, expressed the opinion that a composite depreciation rate of 2.53 per cent would be sufficient for Bell properties in Oklahoma.

Referring to Mr. Richardson's testimony comparing maintenance and replacement costs of the Bell and Independent companies, John Cantrell, the company's general counsel in Oklahoma, contended that such testimony was unfair and had no place in the rate case record; that it failed to take into consideration the high standards of operating and maintaining Southwestern Bell Telephone Co. properties. He also asserted that, legally, inventories and appraisals of Independent telephone properties for purposes of comparisons with Bell costs and operating conditions had no place in the record. The commission, however, overruled Mr. Cantrell's objections and admitted the testimony for "what it is worth" in helping to determine the facts in the case.

V V

Signs Public Utility Bill

Gov. John O. Pastore of Rhode Island on Mar. 17 signed a bill to give the state public utility administrator a maximum of nine, instead of three, months during which he may hold up new utility rates pending investigation and hearing (TELEPHONY, Jan. 15, p. 30).

Introduce Bills to Revise Michigan's Utilities Act

Revision of Michigan's Public Utilities Act in order to provide greater protection to the rate-paying public, is the aim of bills introduced into the state legislature Mar. 16 with the backing of Gov. G. Mennen Williams. (TELEPHONY, Feb. 26, p. 32.)

The administration bills, which resulted from an investigation conducted by Governor Williams, would make these changes in existing law:

(1) That no rate change order may be issued without a full hearing of all viewpoints. This would ban the so-called "interim" order, in which the commission approves an increase on the company's showing alone, pending a further investigation and hearing.

(2) That the report of the commission's staff shall be made a part of the record in every case.

(3) That no commission member or counsel may take employment with any utility for two years after severing his connection with the Michigan Public Service Commission. The present law requires a six-month waiting period.

Governor Williams emphasized that while his bills "do not represent a final cure for all ills, they do represent a starting point in such revision."

"I have talked with the commission itself, with representatives of the utilities, with spokesmen for the affected cities, and with the heads of the commission staff," he said. "It is clear that the rate-payer is not getting adequate representation. This results mainly from two things: First, the practice of issuing so-called 'interim' orders, and, secondly, failure to give full consideration to the findings of the staff.

"It is claimed that the 'interim' order is merely for the purpose of giving prompt relief to the utility pending full hearing. These 'interim' orders are therefore issued without a full hearing, and usually on the company's showing alone. In practice, this results in a rate increase without an opportunity for objections to be heard.

"On the basis of the interim order, the rates are increased, the rate-payers pay more, and no practical way exists to get this money back into the rate-payer's pocket, if later hearings show the original order to have been inequitable. Even if, after a full hearing, the utility is ordered to pay back increases enforced under an interim order, the cost of collecting the rebate is paid by the customers," the governor pointed out.

Governor Williams reported that both he and State Attorney General Stephen J. Roth were surprised to learn that the staff of the Michigan Public Service Commission makes no recommendations in rate cases "unless

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The 4460-L has everything needed for setting poles and stringing lines with a 2-man crew. One man operates the winch (manual or mechanical). The second man sets the pole with the aid of the pole derrick.

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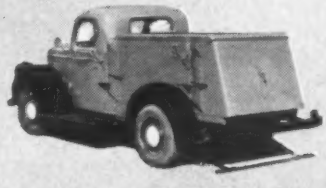

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ACB and

the commission asks for one, which it doesn't ordinarily do. We were further surprised to discover," the governor added, "that in most cases, the report of the state staff of experts is not made part of the record of the case, and consequently cannot be used in any appeal. In some cases it appears that orders have been issued without waiting for the staff to investigate or render either a report on the facts or a recommendation."

It was disclosed at the same time that a special committee of the state House of Representatives, which has been studying commission procedure, would recommend broad changes in the regulatory setup.

Rep. William Broomfield, Royal Oak, who heads the committee, said the recommendations would include (1) abolishing the practice of granting rate increases by temporary orders; (2) increasing commission membership from three to five members; (3) raising commissioners' salaries to $10,000; (4) requiring appointment of special counsel from the state attorney general's department to represent the public at all hearings; (5) assessing utility companies one-half per cent to support a full-time investigating staff; (6) and requiring commissioners to place themselves on record in deciding rate cases.

V V

Asks Higher Rates to Meet Mounting Costs of Operation

An application requesting authority to increase rates at its Chappell exchange was filed with the Nebraska State Railway Commission Mar. 15 by the Platte Valley Telephone Corp., Scottsbluff.

Proposed monthly rates range from $3.00 to $5.25 for one-party, semi-public business service and from $1.50 to $2.60 for four-party residence service.

According to the petition, the requested charges would give a return of 2.32 per cent on the corporation's investment.

Higher rates are necessary "because of drastically increased cost of everything that goes into rendering of telephone service," the corporation stated in its application. Hearing has been set for Apr. 19.

V V

Permitted to Raise Rates

The Missouri Public Service Commission has granted a temporary rate increase to the Western Light & Telephone Co. at its Mount Vernon, Mo., exchange. Annual revenues, under the new schedule, will be an estimated $3,377 a year.

Plans Rate Case Appeal to Massachusetts Supreme Court

The New England Telephone & Telegraph Co. announced Mar. 21 that it planned to take to the courts a decision denying it a $10,000,000 rate increase in Massachusetts.

Joe E. Harrell, president, said the ruling by the Massachusetts Public Utilities Commission on Mar. 18 would be appealed to the state supreme court. The company "is convinced that it cannot continue to operate efficiently under the order," Mr. Harrell stated.

"This order denied the company any increases in revenue," he pointed out. "In fact revenues would be reduced. The rates permitted are only 5 per cent above the rates established in 1925 and are wholly inadequate in the light of increased costs" (TELEPHONY, Dec. 25, p. 23).

V V

Sends Letter to Subscribers Recommending Increased Rates

Close cooperation between the Monroeville (Ala.) Telephone Co. and the Alabama Public Service Commission recently resulted in a rate increase for the company.

The case was handled in a rather unusual manner with the commission writing each Monroeville subscriber a letter, slightly over one page in length, setting forth the old and proposed new rates and stating:

"Usually in a matter of this kind we hold public hearings, but knowing that it is rather difficult for 661 subscribers to find it possible to attend such a hearing, we will give full particulars by means of this letter and, therefore, give each subscriber an opportunity to make known his views to us. If a substantial majority of the subscribers indicate that the proposed new rates are satisfactory, then we will grant the application without a hearing."

The letter went on to point out that the company was in the process of installing "new and more modern" service, described the service, pointed out what the company has done, how much it has spent, and what it planned yet to do and spend.

The letter ends with: "From our knowledge of the whole situation, we feel that the proposed rates are in line with the increased type of service which will be available and will yield the company a profit of slightly over five per cent on its investment. Should you need additional information, please feel free to write us." A postal card was inclosed with the letter on which the subscriber could make known his reaction.

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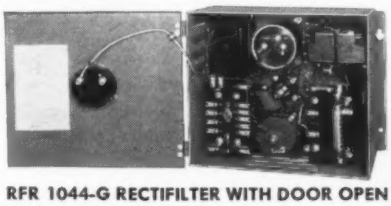

RFR 1044-G RECTIFILTER WITH DOOR OPEN
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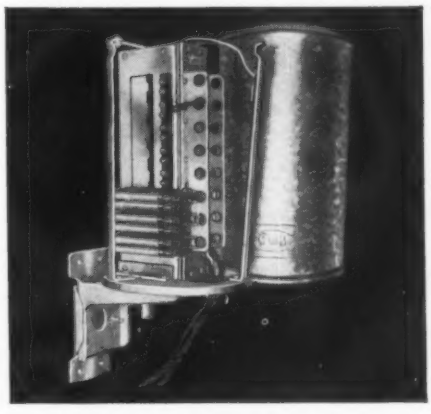
pole cable terminal



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MAXIMUM CONVENIENCE for installation and servicing. Drop wire connections are at front. Drops are led through individual insulating knockout holes. Self-soldering nozzle lies close to pole. Hood locks in raised position for working. Separate mounting bracket eliminates gaining of pole and provides easy installation.

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They stand up faithfully against rain, snow, and sleet. They are unaffected by the hottest days of summer, and the coldest nights of winter.

Wherever insulators are needed—those who know the best specify "Hemingrays."

HEMINGRAY No. 16
Has square groove which provides substantial support for line wire.

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Rate Hearing of Minnesota Company Set for Apr. 7

Application was recently made to the Minnesota Railroad & Warehouse Commission by the Ray (Minn.) Telephone Co. for an increase in rates. The proposed monthly rate schedule includes:

Class of Service	*Present Net Rates*	*Proposed Net Rates*
Business		
One-party	$2.50	$3.50
Two-party	2.00	3.25
Four-party	——	3.00
Multi-party	3.00	4.25
Residence		
One-party	$1.50	$2.25
Four-party	1.25	1.50
Multi-party — Rural	1.25	2.00
Service Stations ...	.50	.75

Temporary disconnects at request of subscriber, one-half the regular rate for the class of service involved.

Hearing on the request was set by the commission for Apr. 7.

V V

Kill Bills to Repeal Utility Anti-Strike Law in Wisconsin

Both branches of the Wisconsin Legislature have killed bills to repeal the state's law prohibiting strikes in public utilities and requiring compulsory arbitration of such disputes.

Besides rejecting the repeal proposals, including one which would have substituted voluntary for compulsory arbitration, the Wisconsin Legislature passed and sent to the governor a bill extending the utility anti-strike act to electric cooperatives.

V V

Summary of Commission Rulings and Hearings

Illinois Commerce Commission

Mar. 21: Hearings on complaints of Chester M. Johnson, Charles R. Heflin *et al* against Woodhull (Ill.) Village Telephone Co. regarding alleged unsatisfactory service, condition of equipment and maintenance charge.

Mar. 22: Hearing on complaint of Woodhull (Ill.) Union Switchboard Assn. against Woodhull (Ill.) Village Telephone Co. regarding alleged lack of cooperation on mutual problems resulting in poor service by both companies.

Mar 22: Hearings on applications of Southwestern Bell Telephone Co. and Dongola (Ill.) Home Telephone Co. for authority to increase rates.

Mar. 23: Hearing on complaint of F. M. McDonald *et al* against National Trail Telephone Co., Altamont, regarding unsatisfactory service and their inability to obtain a service transfer from the Sefton exchange of Fayette County Mutual Telephone Co., Sefton, to the Brownstown exchange of the National Trail company.

Mar. 24: Hearing on application of

Millstadt (Ill.) Telephone Co. for authority to increase rates.

Mar. 24: Commission investigation of improvements made and planned in service by Illinois Commercial Telephone Co., Springfield.

Kansas Corporation Commission

Mar. 28: Hearings on applications of Home Telephone Co., Scottsville, Cuba (Kan.) Telephone Co., and Peoples Telephone Co., Agra, for authority to change rates.

Mar. 29: Hearing on application of Bushton (Kan.) Telephone Co. for authority to change rates.

Apr. 11: Hearing on application of Huron (Kan.) Telephone Co. for authority to change rates.

Apr. 12: Hearing on application of Glen Elder (Kan.) Telephone Co. for authority to change rates.

Minnesota Railroad & Warehouse Commission

Apr. 6: Hearing on application of Mizpah (Minn.) Telephone Co. for authority to increase rates.

Oklahoma Corporation Commission

Mar. 30: Hearing on application of Elmore City (Okla.) Telephone Co. for authority to increase rates.

Apr. 23: Hearing on applicaton of Disney residents for telephone service.

May 4: Continued hearing on application of Southwestern Bell Telephone Co., Southwestern Associated Telephone Co., Lubbock, Tex., Southwestern States Telephone Co., Brownwood, Tex., and Oklahoma Telephone Co., Broken Arrow, for continuance of rules similar to those of expired federal regulation U-2 governing order of service installation.

May 10: Continued hearing on application of Chattanooga, Okla., Chamber of Commerce for improved service from the Southwestern States Telephone Co., Brownwood, Tex.

Wisconsin Public Service Commission

Mar. 23: Hearing on application of Clear Lake (Wis.) Telephone Co. for authority to increase rates.

Mar. 24: Hearings on complaints against Urban Telephone Co., Clintonville, by (1) Bowler Advancement Association regarding rates; (2) Harvey Polzin *et al* regarding Bear Creek-Clintonville service.

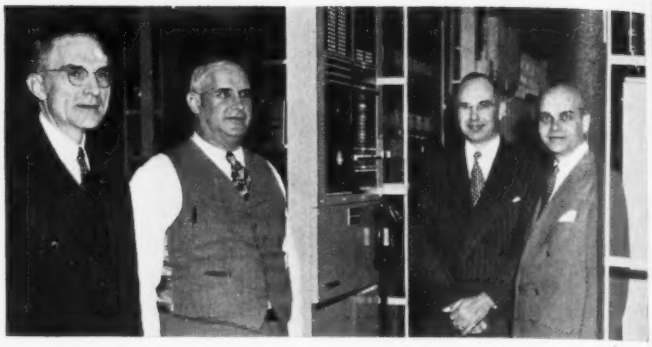
Along the Toll Line

(Concluded from page 20)

meets at her switchboard, however, is going to be a familiar one. The most experienced toll operators run into something new once in a while. And whether experienced or not, the good operator *never* hesitates to call on her supervisor for assistance.

V V

» It has been said: "Nowadays the earth revolves on its taxes."



LEFT PHOTO: New exchange building of the Sunland-Tujunga Telephone Co. RIGHT PHOTO: Standing at the new director monitor panel are, left to right: W. B. WESSELLS, telephone and telegraph engineer, California Public Utilities Commission; EDWARD SWARTZ, staff operating engineer; H. F. LELLO, vice president and general manager, Automatic Electric Co., and NEIL C. BROGGER, assistant vice president, Bank of America.

Ends Three-Year Construction Program With Dial Cut-Over

Culminating a three-year construction program, the Sunland-Tujunga Telephone Co., Sunland, Calif., cut into service its new Los Angeles "FLorida" dial exchange Feb. 12. In the last three years the company's investment has been increased from $200,000 to $1,437,000.

During 1946, 1947 and 1948 extensive additions to outside plant, the construction of new buildings and the replacement of all instruments with modern dial type telephones were also completed. Since the war the company has grown from 1,722 telephones in service to 4,309 telephones in service.

The new 2,500-line, 5,000-terminal director switching "Florida" office is a part of the Los Angeles metropolitan area telephone network, coordinated with 34 other telephone exchanges in the metropolitan area and equipped to give full dialing service to most of Southern California. The new equipment was manufactured and installed by Automatic Electric Co., Chicago, Ill. It displaced a 12-position manual switchboard.

The director type switching unit installed in the new office is a forerunner of complete automatic toll ticketing service and direct subscriber dialing into all of the Los Angeles metropolitan area scheduled for installation by September, 1949. Immediate operator toll dialing service was inaugurated with the Feb. 12 cut-over, preparatory to offering the direct dialing facility to all subscribers later in the year.

The automatic toll ticketing feature will give subscribers of the new "Florida" exchange, located in the Sunland-Tujunga community of Los Angeles, dialing access to approximately one million telephones. Toll tickets will be prepared automatically by perforating a teletype tape which in turn will be interpreted by International Business Machines accounting equipment for summation on the subscriber's bill.

Sunland-Tujunga Telephone Co. is managed and engineered by J. T. Naylor, vice president and general manager. Other officers are: A. Adams, Jr., president; T. W. Bernhard, vice president; Jean D. Weir, secretary, and F. G. Weir, treasurer. Included among guests of the telephone company at a cut-over dinner were H. F. Lello, Chicago, vice president and general manager, Automatic Electric Co.; Walter B. Wessells, telephone and telegraph engineer, California Public Utilities Commission, and other commission staff members; N. C. Brogger, San Francisco, assistant vice president, Bank of America; K. D. Schwab, general commercial agent, The Pacific Telephone & Telegraph Co., and other officials of the Bell System.

J. T. NAYLOR

No More Numbers

Operator: "Number, please?"

Ex-convict: "Say, don't get funny. I've been usin' a name for almost two weeks now!"

In the Nation's Capital

(Continued from page 18)

97 per cent; Utah, 65 per cent; Washington, 81 per cent; and Wisconsin, 67 per cent.

The over-all average percentage of increases allowed, including states granting 100 per cent of amount sought (but excluding Delaware, Iowa, and Texas) is 87 per cent. In a number of the states subsequent rate request applications have been made. The full amount of raises, as sought, were put in effect by the courts on review of commission orders in Alabama, Georgia, Mississippi, Tennessee, and Vermont. Commission orders are now under court review in Kentucky and Rhode Island.

Status of Bell Cases in States

Alabama—Commission order 3/5/48 granted $360,000 increase. Order 3/17/48 made certain corrections in original order. On court appeal, commission order was nullified and full increase authorized in January, 1949.

Arizona—First request for $865,000 granted 3/7/47 in full by commission. Second request (February, 1949) for $1,464,000 is pending.

Arkansas — Granted on temporary basis subject to refund.

California—First request was for $40,046,000 raise. Series of commission orders granted $28,364,300. Second request for $33,655,000 filed November, 1948. On 2/23/49, commission granted a $13,000,000 interim increase.

Colorado—Includes raises granted by "home rule" cities as well as by commission.

Delaware—No state utility commission. Application pending with Wilmington City regulatory agency.

Florida—Commission order 4/26/47 granted $2,406,000 increase in full. Second request, as amended, seeks $4,837,000. $1,608,000 has been granted on temporary basis under bond.

Georgia—Commission order 1/23/48 granted $1,600,000 of requested $3,700,000. Appealed to courts. Under court order of 8/24/48, full increase put in

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Reduces Costs

Improves Connections

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2. Drop wires attach to same studs, permitting testing without opening a taped connector.
3. All metal parts are rust-proofed, the one piece drawn metal hood is hot-galvanized, and the terminal as a whole is completely weatherproof.

Get rid of annoying high-resistance connections—make testing easier—reduce maintenance costs—with economical Testerm drop wire connectors. We will be glad to quote on your needs. Write for details today.

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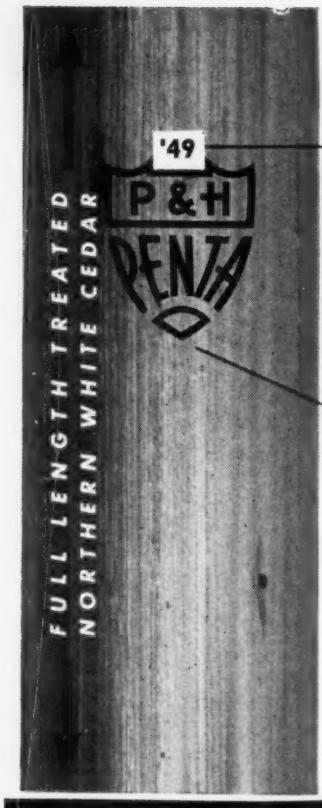
CHICAGO 14 ILLINOIS



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effect. Company raised rates $3,050,000 on 12/23/48. Commission order 1/10/49 granted $1,480,000 of $3,050,000 that company put in effect. Company petitioned commission for rehearing on 1/10/49 order and amended request to include an additional $1,000,000.

Idaho—Includes applications filed by Pacific Telephone & Telegraph Co. and Mountain States Telephone & Telegraph Co.

Illinois—Includes a small amount requested by Southwestern Bell Telephone Co.

Indiana—Commission order 10/20/47 granted Indiana Bell Telephone Co. $3,000,000 of a requested $3,425,000. A $65,000 increase was granted Illinois Bell Telephone Co. There is pending the application of the Illinois company for a $1,000,000 raise and the application of the Indiana company seeking "just and reasonable" rates, with no amount specified.

Iowa—No state commission regulation of telephone companies.

Kansas—Commission order 1/10/48 dismissed application for $3,349,000. On appeal to courts, case was remanded to commission. In October, 1948, commission granted a $1,200,000 temporary increase. On 1/14/49, commission revised previous order and granted a $3,314,000 temporary raise.

Kentucky—Commission order 9/5/47 granted $1,575,000 of requested $2,013,000. Commission order 11/9/48 denied in full subsequent $2,055,000 request. Later order under review by court; rates in effect under bond.

Louisiana—Commission order 6/24/47 granted $2,944,000 of requested $3,255,000. Subsequent application for $4,798,000 filed.

Maine — Commission order 5/23/47 granted $1,350,000 of requested $1,500,000. In August, 1948, commission denied in full a $1,770,000 request. Commission order 11/8/48 granted a $1,000,000 temporary increase in connection with application, as amended, for $3,400,000.

Maryland—Commission order 8/13/47 granted $5,377,000 of requested $6,397,000. Commission order 3/11/49 granted in full a $4,000,000 temporary increase.

Massachusetts—Dec. 19, 1948, commission denied in full a request to increase the pending application by $7,000,000.

Michigan—Commission order 10/6/48 granted $8,217,000 of requested $10,500,000. Subsequent application for $20,400,000 increase filed January, 1949.

Minnesota—Commission order 1/23/47 granted $3,000,000 of $6,285,000 request. On petition for reconsideration, commission on 7/9/48 granted an additional $2,000,000. Pending request filed in December, 1948.

Mississippi—Commission order 4/14/47 granted $890,000 of requested $1,415,000. On 2/7/48 commission denied in full $1,500,000 supplemental request. On appeal to court, increase allowed on 3/3/48. Subsequent application filed for $2,400,000.

New Hampshire—Commission order 7/28/47 granted $800,000 emergency increase of $3,469,000 requested. Appealed to court and remanded to commission. Commission granted an additional $770,000 emergency raise. On 7/30/48, commission granted a further

$755,000 emergency increase. 7/30/48 order was appealed to court and remanded to commission on 2/1/49. All increases are on an interim basis.

New Jersey—Commission order 12/25/47 granted $10,515,000 of requested $16,150,000.

North Carolina—As to $1,709,000 of amount requested, commission order 11/23/46 granted $950,000 increase. (First post-war rate increase for Bell System). On 1/30/48, a further increase of $680,000 was granted. Subsequent application 11/22/48, as amended, is pending.

Ohio—Includes application of Cincinnati & Suburban Bell Telephone Co. for $2,835,000 increase, and application of Ohio Bell Telephone Co. for $8,500,000.

Oklahoma — Commission order 4/19/48 denied temporary raise of $2,900,000. In effect now on temporary basis under bond pursuant to court order.

Oregon — Commission order 1/8/48 granted $1,544,408 of requested $2,250,000. Subsequent application for $4,116,000 filed.

Rhode Island — On 3/31/48, order granted $1,200,000 of requested $2,758,000 increase, and is now under court review. Subsequent application for additional $3,628,000, above the $1,200,000, increase now pending.

South Carolina — Commission order 3/20/47 granted $785,000 of requested $800,000. Commission order 12/9/48 granted subsequent request for $1,820,000 in full.

Tennessee—Increase denied in full by commission order of 11/6/47, but order held invalid on court review.

Texas—No state regulation of telephone companies. Variation between figures in columns two and four is result of action of "home rule" cities.

Utah — Commission order 8/10/48 granted $591,203 of requested $912,000. Subsequent application for $864,000 increase filed 2/11/49.

Vermont—Commission order 5/23/48 granted $803,000 of requested $1,253,000. Company obtained court stay and full increase is in effect under bond. A subsequent application for $1,000,000 is also in effect under bond.

Washington—Commission order 10/18/47 granted $5,700,000 of requested $7,050,000.

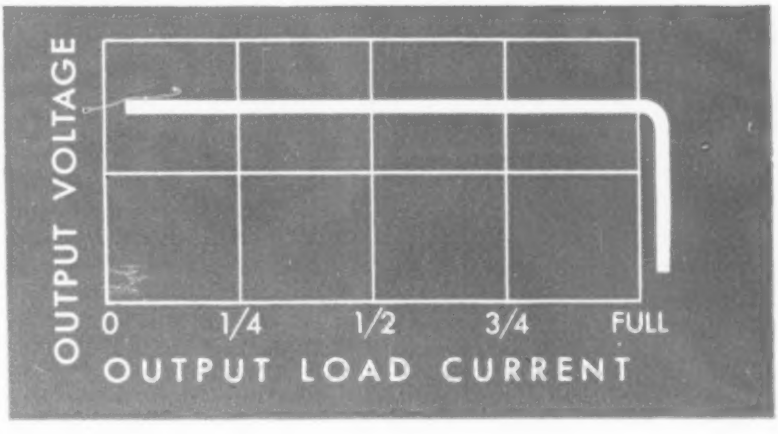
West Virginia — Commission order 6/28/47 granted $900,000 interim increase on a $1,510,000 request. Commission order 5/31/48 granted a further $1,510,000 interim increase in full. Subsequent application for $3,950,000 filed in November, 1948.

Wisconsin — Commission order 9/18/47 granted $6,400,000 of requested $9,500,000.

V V

Chance Moves Office

The A. B. Chance Co., Centralia, Mo., recently announced the transfer of its eastern division sales office from New York City to 2003 Parkard Bldg., 15th & Chestnut Sts., Philadelphia 2, Pa. The new office will be headquarters for the company's eastern division sales manager, C. T. Nevins, and other eastern division salesmen, covering the New England states.



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Take another look at this regulation curve. It's smooth and flat over the entire load range . . . with automatic over-load protection through constant current control at any pre-set load. Graphically, it represents the precise control characteristics achieved by Power Equipment Company during its 14 years specialization in circuit development and design. And these characteristics, used singly or together, may readily and economically be applied to any product or process whose functions can be translated into electrical values. So if you've been looking for closer control and regulation . . . either for the equipment you make or for your production operations, why not get in touch with PECo engineers today? Chances are they already have what you need . . . and can give it to you fast.

Bulletin No. 848 describes and illustrates PECo research, engineering, and manufacturing facilities. Write for your copy today.

POWER EQUIPMENT *Company*

Specialists in Controlled Rectifiers Since 1935

55 ANTOINETTE STREET / DETROIT 2, MICHIGAN

Dependable

DC POWER SUPPLY

for Lamp Signal and Automatic Switchboards

LOW IN FIRST COST!

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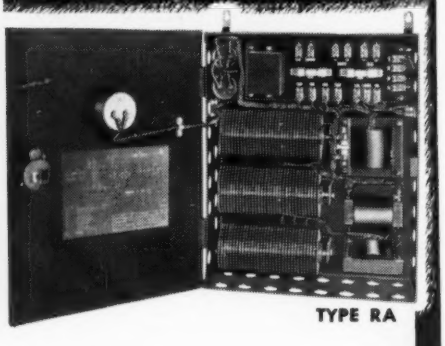
ELECTROX

CONSTANT VOLTAGE BATTERY ELIMINATORS



TYPE RA

MANUFACTURED to the exacting standards of the telephone industry, the Type RA ELECTROX Constant Voltage Battery Eliminator will deliver direct current of suitable smoothness for operating lamp signal and automatic switchboards without the use of batteries.

The Type RA ELECTROX delivers a practically constant output voltage irrespective of current drain up to the maximum output of the rectifier. Constant voltage output is obtained automatically — requires no manual adjustments.

Housed in a ventilated steel wall mount cabinet, the Type RA ELECTROX eliminator requires no attention or maintenance. Simply plug it into your AC power supply and forget it. Available in numerous capacities to supply required DC voltage, with or without power-off relay.

For complete information on the Type RA and other ELECTROX eliminators for the telephone industry, write for Bulletin 1462, or see your Jobber.

RECTIFIER DIVISION

The SCHAUER MACHINE COMPANY

2057 Reading Road, Cincinnati 2, Ohio

Heller Markets New Heavy-Duty Stapler

A new heavy-duty stapler, which can be bolted in any convenient position to a bench, work table, or packing table, has been announced by the Heller Co., Cleveland, Ohio. In limited working space, these staplers can be set up in groups of two or more for multiple stitching operations.

The stapler has a long actuating arm to give exceptional leverage—making heavy-duty stapling by hand effortless. Any female help can use this stapler without strain or fatigue.

A feature of the Heller hand-side stitcher is its adaptability in using wide or extra wide staples in several leg lengths from one-quarter inch to nine-sixteenths inch. This makes possible the fastening by hand of many materials which ordinarily cannot be stapled with smaller machines.

It will easily stitch sides and ends of all types of containers up to eight inches and can also be equipped with a special anvil arm to accommodate up to 14 ins.

V V

>>The telephone industry in the United States has increased its plant investment by more than $3,000,000,000 since the end of the war; the total is now well over $9,000,000,000.

LOOK

Let Gemar do your outside telephone plant construction work. This will increase your operating efficiency and decrease your maintenance cost.

This can be done at a saving by having your construction work done by contract or other arrangements. All necessary time-saving equipment used to save you money.

We also do cable spinning.

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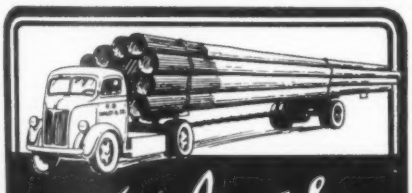

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Truck Shipments
from our Ohio yard

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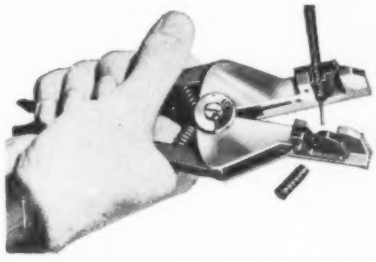
Also yards at
Minneapolis
and Haley, Idaho

R. G. HALEY & CO., Inc.
SPITZER BLDG.
TOLEDO 4, OHIO

Ideal Announces New Hand Type Wire Stripper

A new hand type, pocket size wire stripper called the "Stripmaster" has been announced by Ideal Industries, Inc., 1634 Park Ave., Sycamore, Ill.



Featuring an "automatic" cam action that releases the jaws, the wire may be removed after stripping so the crushing of stranded wire is completely eliminated, the company states.

It is designed for stripping building, fixture or telephone wire, lamp and portable equipment cords (individual conductors) automotive wiring, radio and instrument wire and cable, switchboard and aviation wire, FM and TV down lead wire.

Squeezing the handles grips the wire, cuts the insulation and strips the wire—all in one operation. Then as the handles are released the grippers automatically free the wire and the jaws return ready for the next cut. There is no possibility of nicking or cutting the wire or fraying of wire ends, it is said.

Four models handle all wire gauges from Nos. 22 to 8. A fifth model is designed especially for FM and TV down lead wire. Blades are interchangeable on all models and can be taken off and replaced in less than one minute simply by removing two screws.

V V

» More than 25,000,000 miles of telephone wire have been added in the United States since the end of the war. If all this new wire were strung out in a single length, a man striding along it at a brisk pace would have to walk more than 700 years to reach the end.

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Layouts—Cost Studies
Construction and Installation Practices
Operating and Maintenance Methods
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Wells Bldg., Milwaukee 2, Wis.
★ ★
Northern White and Western Red
Cedar Poles—Plain or Butt-Treated

ALL the strength and durability inherent in steel are combined—with definite economies—in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of *Crapo* Galvanized Products near you or write direct for further information!

INDIANA
STEEL & WIRE CO.
MUNCIE, INDIANA

Party Line Transmission and Ringing Improved with Vincent Rare Gas Relay

May be Used with Harmonic or Coded Bells

Vincent Rare Gas Relay, RTC-2. Ready for Mounting.

End objectionable noise interference due to transient and induced voltages, and provide additional lightning protection in bell circuits, with the Vincent Rare Gas Relay. Compact, non-mechanical, the Vincent Rare Gas Relay is easily inserted in the bell box, or at the ground connection or protector block on compact handsets, in series with each bell. It needs no further maintenance.

Since the resistance of the relay is practically infinity below 60 volts, its normal breakdown voltage, the line remains normally free from paths to ground. Ringing voltage of 85 volts ionizes the rare inert gases, is transmitted without difficulty.

The Vincent Rare Gas Relay may be used on magneto or common battery lines. Over 100,000 in daily use! Write for details.

L. S. BRACH Mfg. Corp.

Dept. X, 200 Central Ave., Newark, N. J.

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WILL CONSIDER MEN HAVING A MINIMUM OF 3 YEARS EXPERIENCE

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PLANT SUPERINTENDENT. Company in Southwest. Prefer engineering graduate with experience. Give details of education and experience. Attach snapshot. Write Box No. 2746, c/o TELEPHONY.

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KELLOGG RINGERS 84 TYPE

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ADJUSTABLE LEGS AND CORE

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TELETYPEWRITERS—All Models.
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NORWOOD TELEPHONE CO., Norwood, Mo. Fifty subscribers. On Highway 60 and Frisco Railroad. Good building with living quarters. Priced right to sell exchange and building. Write Norwood Telephone Co., Norwood, Mo.

Immediate shipment. Pole brackets, crossarms, hardware. Wire: drop, emergency. Test-sets, coils, condensers, telephones. Hundreds of items. Elfvin Products, Flemington, N. J.